

# MARINE REVIEW.

VOL. XII.

CLEVELAND, O., DECEMBER 5, 1895.

No. 23.

## Canada's Merchant Shipping.

A copy of the latest report of the Canadian deputy minister of marine, just at hand, shows a decline of 42,915 registered tons in the merchant shipping of the dominion during the year ending Dec. 31, 1894. Canada's merchant shipping has been declining at the rate of 25,000 to 50,000 tons a year for five years past, although there has been no great difference in the amount of tonnage owned in the country during the past twenty-five years. On Dec. 31 last the number of vessels of all kinds on the registry books of the dominion was 7,245, measuring 869,624 tons; on the same date in 1873, twenty-one years ago, the number of vessels was 6,783 and the tonnage 1,073,718. Of the 7,245 vessels now owned in the dominion, only 1,640 of 240,906 tons, are steam. Assuming the average value of all vessels, steam and sail, to be \$30 a ton, the value of the registered tonnage of the country on Dec. 31 last would be \$26,088,720. The number of new vessels built and registered in the dominion during the last year was 326, measuring 21,243 tons, register tonnage. Estimating the value of the new tonnage at \$45 per ton, it gives a total value \$959,935 for new vessels. The following table shows the number and tonnage of vessels owned in the dominion on Dec. 31 of each year for three years past:

PROVINCES.	Dec. 31, 1892.		Dec. 31, 1893.		Dec. 31, 1894.	
	No. Vessels	Registered Tonnage.	No. Vessels	Registered Tonnage.	No. Vessels	Registered Tonnage.
New Brunswick.....	946	181,779	1,010	156,086	1,003	136,257
Nova Scotia.....	2,731	425,690	2,715	396,263	2,710	371,432
Quebec.....	1,408	162,638	1,426	161,121	1,427	160,590
Ontario.....	1,347	141,750	1,370	146,665	1,480	148,525
Prince Edward Island.....	196	22,706	188	20,970	191	19,650
British Columbia.....	298	23,448	315	24,900	336	26,455
Manitoba.....	81	6,118	89	6,534	98	6,715
Total.....	7,007	964,129	7,113	912,539	7,245	869,624

## Bids on the New Battleships.

The announcement from Washington that the Newport News Ship Building and Dry Dock Co. had underbid, as far as department plans are concerned, all competitors for building the two new battleships authorized by the last congress is proof that the management of the big southern ship yard is determined to follow up their contract for gunboats, which is now about completed, with more naval work. But there was another big surprise in the bids which were opened on Saturday last, and it will probably be some time before the department announces its conclusions. The Cramps offered to build two battleships with armor for the hulls and throw in another ship of like type, but without armor, all on their own plans, for the sum fixed by congress as the ultimate cost of two ships. An illustration of the type of vessel proposed by the department, together with a synopsis of the specifications, is contained in our issue of Nov 28.

When the bids were opened it was found that the Wm. Cramp & Sons Ship and Engine Building Co. of Philadelphia offered to construct one of the vessels on the department's plans for \$2,820,000, or two for \$2,750,000 each. Then they offered to build three ships on their own plans, with complete armor for the hulls of two of them, for \$8,000,000. They offered again to build two ships on their own plans, with armor for both hulls and guns, for \$3,850,000, and finally it was proposed to build the ships on another set of plans of their own for \$2,500,000 for one or \$2,450,000 each for two. The Union Iron Works of San Francisco bid on the department's plans \$2,740,000 for one ship or \$2,690,000 for each of two. On their own plans they bid \$2,650,000 for one or \$2,640,000 for each of two ships. The Newport News Ship Building & Dry Dock Co. of Newport News, Va., put in a straight bid, the lowest for the department's plans, namely, \$2,350,000 for one or \$2,250,000 for each of two boats. As the law requires one of the ships to go to the Pacific coast if the price is reasonable, it is quite probable that the Union Iron Works will receive the contract for one ship, as its bid is about a quarter of a million less than the contract price for the Iowa.

CAPTAINS AND MATES ARE INVITED TO CALL AT THE OFFICE OF THE MARINE REVIEW AND LOOK OVER THE CHARTS AND SAILING DIRECTIONS OF LAKES SUPERIOR, MICHIGAN, HURON, ERIE AND ONTARIO, PUBLISHED BY THE HYDROGRAPHIC OFFICE.

## Ship Yard Matters.

From the present outlook the Detroit Dry Dock Co. will be busier this season than for several years past. The company has two freight steamers and a passenger steamer and several contracts in sight in addition to an unusual amount of repair work for the coming winter. This includes the fitting of the Howden hot draft system to several steamers. Work on the Cleveland & Buffalo line passenger steamer is being pushed night and day. The only difficulty in the way of her completion within the specified time is the delay in getting material. Last May some material was ordered from Philadelphia. Personal visits to the mill and all inducements failed in securing the material. Finally it was ordered from England and arrived and was put in place on the steamer before the material arrived from Philadelphia. Every effort will be made to turn out the finest and fastest side-wheel passenger steamer on the lakes. She will be fast enough to make the trip between Buffalo and Cleveland an interesting one when the Northern line passenger steamers are taken into consideration.

A picture or drawing of the shattered bottom of the steamer Northern Wave in dry dock at Detroit—a result of her going ashore at Sand Beach—would make an interesting study. She struck in a bad place and was pounded badly, all of which would be expected to produce some serious effects. She is strained in different parts up to the spar deck and will require almost a whole new bottom. However, the interesting feature of the wreck is the manner in which the bottom plates cracked wherever a stone was struck. There is not a great deal of buckling, and where the metal has stood the punishment of bending or indentation the cracks appear at some distance. Ordinary cracks in plates pursue the course of the strain, usually in a straight line. The cracks in the plates on the Northern Wave, however, are of a circling kind and appear more like cracks in iron. A glance at the wreck would readily give rise to the question as to whether steel plates do not deteriorate more rapidly than iron. English exchanges have been paying some attention to this matter of late.

Capt. Alex. McDougall says that had the bottom of the steel steamer Centurion been constructed on any system other than the cellular system he feels quite certain that repairs necessitated by her stranding on the rocks at Isle Royale would have been far more costly than they were. It was at first thought that repairs would have cost full \$35,000 but the expense was approximately \$20,000. The work was undoubtedly done more rapidly than anything of its kind ever undertaken on the lakes. The West Superior yard is fast gaining a reputation in repair jobs. It is hoped to present in a future issue some illustrations that will admit of an intelligent discussion of repairs on the Centurion.

Capt. Alex McDougall, F. W. Wheeler, and F. W. Gilchrist and A. W. Comstock of Alpena have all been in Cleveland during the past few days looking after vessel matters. Messrs. Gilchrist and Comstock are interested in the wooden schooner that is being built at Algonac by Abram Smith & Son. The vessel is to be 210 feet keel, 37 feet beam and 14 feet hold. She will have a schooner stern and schooner rig; will be diagonally strapped and steel arched, and will have steel keelson plates, thus classing A 1<sup>st</sup>. The boat will carry of lumber about 1,250,000 feet and of coal 1,800 tons on 13 feet of water. She will be equipped with steam apparatus for hoisting, anchors, sails, etc.

At the works of the Union Dry Dock Co., Buffalo, operations on the new package freighter are progressing slowly, on account of delay in receiving angles. There are nine strakes of plating on the bottom of the vessel and a few channel floors in place. Center keelson plates are ready to be put in place when angles are received. There is in all about 300 tons of plate ready to be put in place, or that could be readily furnished, if other material was not delayed. The steel yacht for W. J. Connors is all in frame.

It is understood that repairs to be made by the American Steel Barge Co. on some of the vessels of the Northern Steamship Co. that are to winter at the head of the lakes will include steel decks for two or three of the freight steamers.

Hurd & Hanenstein of Buffalo are figuring on the construction of a second wooden barge to tow with the steamer Wotan. The barge building at Marine City for Connely Bros. of Buffalo will tow with the Wotan.

Observations on Lake Superior, taken in August, show a bottom temperature of 38.8 degrees F. in 158 fathoms, the surface temperature being 50 to 53 degrees F.



### Around the Lakes.

Capt. Neil McKenzie, who was known as master of the Sligo and Lothair, Canadian vessels, died at his home in Windsor, Ont., Sunday.

Rockefeller interests on the Mesabi iron range are said to have secured control of the Rouchleau Ray property. The purchase price is reported at \$1,250,000.

About Dec. 10 a 10-inch steam whistle will be established on South Fox island, Lake Michigan. The whistle will sound blasts of three seconds separated by silent intervals of seventeen seconds duration.

Letters bearing the following names are at the marine post office, Detroit, Mich.: D. E. Bedford, Thos. Bresnahan, Oyas Barrett, Harry Farrell, George Ledue, B. J. Moore, Joe Mercier, James J. Norcross, Robt. Sinclair, Capt. James Travers, Henry Waldmann.

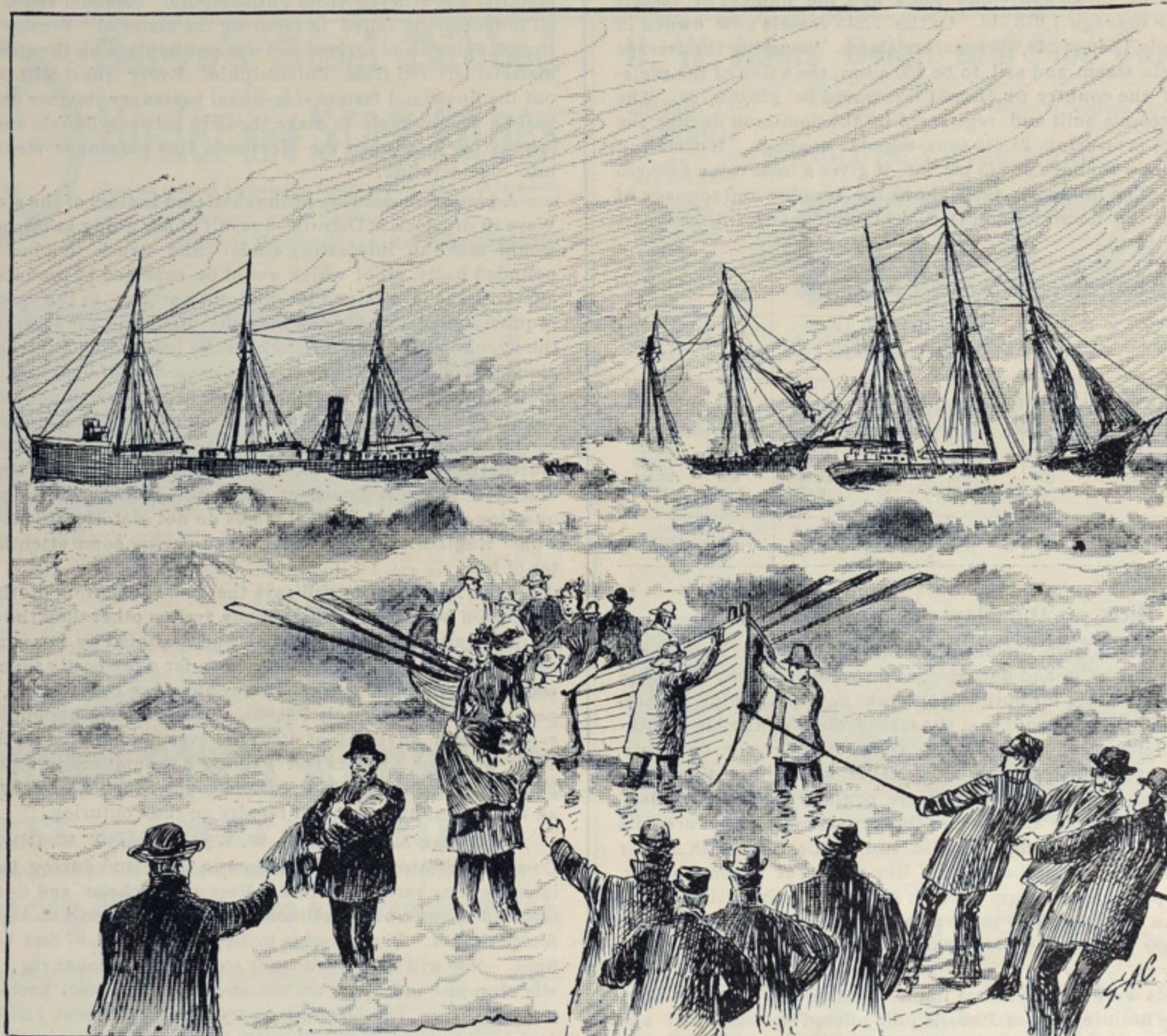
Saw-mills at the head of Lake Superior have closed down for the season. The cut on St. Louis bay is estimated at 302,000,000 feet, while for the Duluth district the estimate is 466,400,000 feet. Probably 160,000,-

The Craig company has had the steamer Reynolds in the dock but she is now out and will be followed by the Norwalk. The steamer Volunteer is also at Toledo to be docked.

The Independent Tug Line of Chicago has added still another good tug, the W. H. Wolf, to their already powerful fleet. One must come to the conclusion, from recent additions to this line, that this company will get together a fleet of tugs second to none on the chain of lakes. In their tug Charnley they have one of the most powerful all-around tugs on lake Michigan. She has proved to be a splendid harbor tug, and has the advantage of steam steering gear. Her outside abilities have been tested on many occasions. The latest demonstration of her powers was at the wreck of the J. Emory Owen, where it is understood both the tugs Charnley and Welcome performed some highly satisfactory work.

### Spencer on Marine Collisions.

In a recent issue the REVIEW acknowledged receipt of a book on the "Law of Marine Collisions" by Herbert R. Spencer, admiralty attorney



STEAMER OWEN AND CONSORTS MICHIGAN AND NICHOLSON ASHORE NEAR CHICAGO.

Life savers rescuing crews of the wrecked vessels—From sketch by G. A. Coffin in the Chicago Tribune.

000 to 175,000,000 feet of lumber has been carried over this season at Duluth and Superior.

Wrecker McMorran of Port Huron has, after three months work, raised the wooden steamer Britannic, which was sunk near Ballard's reef, Detroit river, by the steamer Russia. The Britannic is now in Detroit and will be rebuilt there during the winter. The value of the wreck has not as yet been determined.

The harbor of refuge at Grand Marais, Mich., on the south shore of Lake Superior, is to be lighted at last. About Dec. 10 a fixed white light of the sixth order will be established on the outer end of the west pier, entrance to this harbor. During thick weather a bell, hung on the side of the light tower, will be struck by machinery a single blow every thirty seconds.

The ferry steamer Shenango No. 2, left Craig's yard, Toledo, Monday at 10:30 p. m., and arrived at Conneaut at 11 a. m. the next day. This was certainly a good run for a new boat that was contracted to make only 12½ miles an hour with machinery worn down and in good running shape. This first run to Conneaut was without the aid of the forward engine.

of Duluth. There has been a great need for a work of this kind, there being no other modern American text book on the subject. After discussing the subject of the jurisdiction of our courts over collision cases, Mr. Spencer gives the full text of the different codes of rules, which congress has adopted from time to time, for the purpose of avoiding collisions, including the recent White law covering the great lakes, with a reference under each article to the various cases under which its subject matter has been construed by the courts. This is an extremely useful feature of the work. The author then takes up separately each special branch of collision law, under the heads of lights, navigating in fog, collisions between sailing vessels, collisions between steam vessels, collisions between steam and sailing vessels, collisions with vessels not under way, collisions with tugs and tows, river and harbor navigation, miscellaneous cases, collision damages, the law of limited liability, the admiralty rules of the federal supreme court, and the pilot rules for the lakes. The text is supplemented by copious notes and references to all the decided cases on each branch of the subject. The book will doubtless prove very useful to all who care to familiarize themselves with the matters of which it treats.



## TEN NEW SHIPS.

CONTRACTS FOR THAT NUMBER PLACED BY PICKANDS, MATHER & CO.—  
EIGHT ARE FOR MR. JOHN D. ROCKEFELLER.

Pickands, Mather & Co. of Cleveland have, within the past few days, closed contracts with lake ship builders for ten steel freight vessels, steamers and tow barges, all of 4,000 gross tons capacity on 14 feet 6 inches draft. Two of the vessels are for the Minnesota Steamship Co. and eight are for Mr. John D. Rockefeller. It is possible that within a few days options on two other vessels may be taken up, increasing the number to be built for Mr. Rockefeller to ten.

The vessels will all be of the most modern type of lake freight carrier, with no special difference in form of construction. The steamers will be 404 to 418 feet keel and the tow barges 350 to 376 feet keel. The contracts are distributed among several lake ship building firms, including the American Steel Barge Co., who will build two of the boats, one steamer and one barge, both whalebacks. The two boats to be built for the Minnesota Steamship Co. are in addition to two others now being built at South Chicago, thus increasing that company's fleet this winter by four vessels.

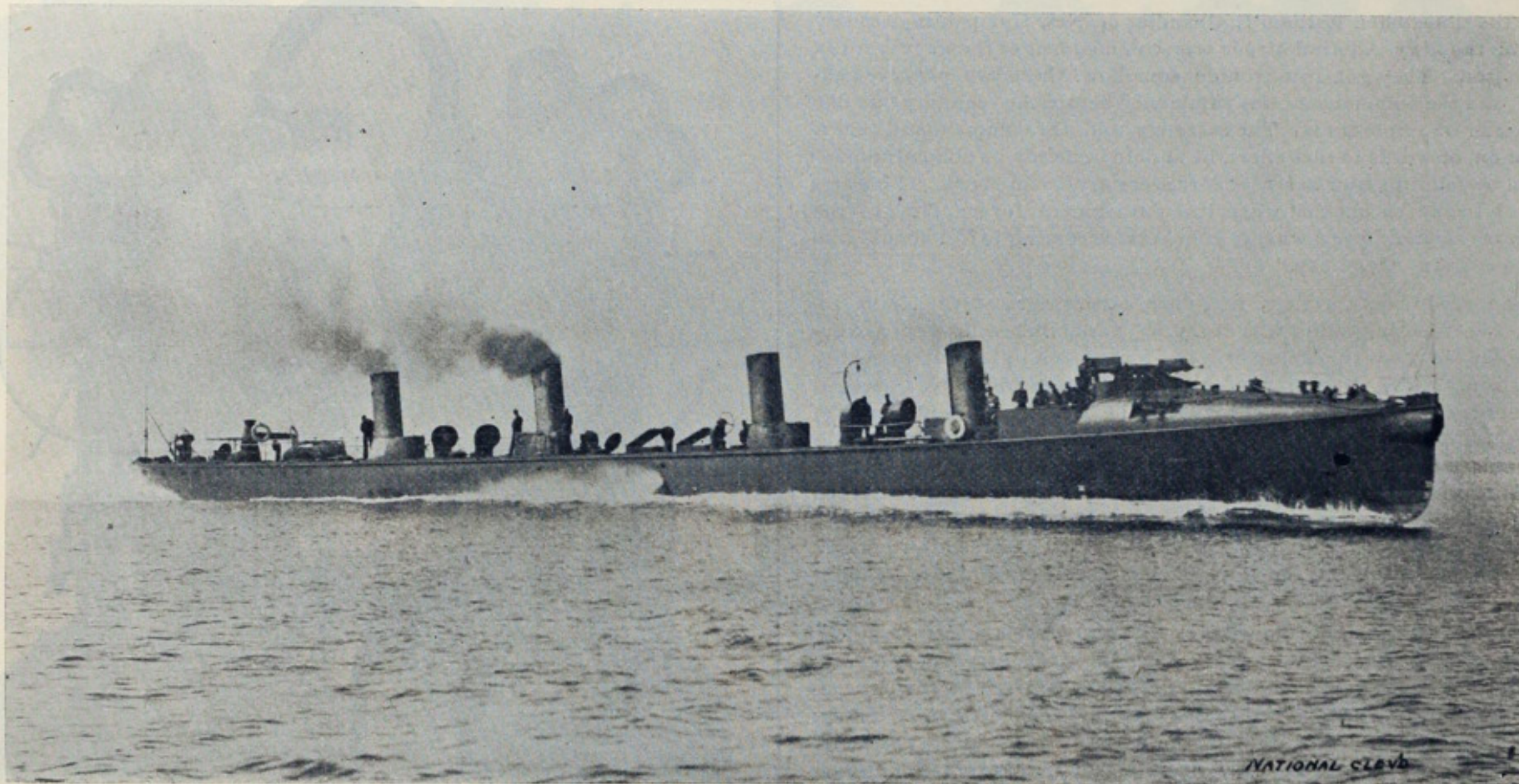
It is understood that Mr. Rockefeller, who has within a few years acquired interests in the Mesabi iron range and the American Steel Barge Co., looks for prosperous business conditions generally for some time to come, and regards the present as a propitious time for the building of vessels.

These contracts will increase the number of orders now held by lake ship builders to forty. The value of these forty vessels is full \$6,500,000.

## Seeking Assistance from Canada.

When the Lake Carriers' Association meets in Detroit next month the committee on aids to navigation will have prepared a strong petition to the Canadian government asking for new lights and changes in lights in the vicinity of Point au Pelee, Lake Erie, where so many strandings have occurred during the past season. The committee is proceeding in a systematic way, and under the direction of Capt. Geo. P. McKay, treasurer of the association, copies of a petition to be signed by vessel owners have been sent to all of the leading lake cities. This petition will show the tonnage represented by each vessel owner whose signature is obtained. Another form for masters, with the same end in view, has been sent to secretaries of the principal lodges in the Ship Masters' Association. The Canadian Vessel Owners' Association has been informed of what is being done and has been asked to join in the movement.

The dominion government is asked first to move the life saving station now on Point au Pelee island to the point on the main land, as all accidents in this vicinity for some time past have occurred near the point and in places where the wrecks could not be seen from the life saving station as at present located. Secondly it is proposed to remove the light now in Pelee island to the middle ground. A third request is for the establishment of a light-ship to the southward and eastward of Point au Pelee, where twenty or more vessels have stranded during the past



BRITISH TORPEDO BOAT DESTROYER UNDER WAY.

(Engines for vessels of this type are described in another part of this issue.)

## Steamer of 13,000 Tons Deadweight Capacity.

New York representatives of the Hamburg-American Steamship Co. confirm all that has been said of the big steamship Pennsylvania, to be built by Harland & Wolff, Belfast, and also announce that six new steamers, of about 7,000 tons deadweight capacity each and costing in all about \$1,800,000, will be built for their company by British builders. The steamer Pennsylvania, which is intended for service between New York and Hamburg, will be without question the largest steamer afloat. Her deadweight capacity will be 13,000 tons, and she will have accommodations for 200 cabin and 1,500 steerage passengers. Her length on the water line will be 560 feet, beam 62 feet and depth of hold 42 feet.

Three of the six additional new vessels will be built by the Palmer Ship Building & Iron Co., on the Tyne. The other three are vessels on the stocks in British yards that were purchased while under construction.

Editor MARINE REVIEW: I notice plans and description of a side-wheel engine on page 8 of your last number and would draw your attention to United States patent No. 190,534, which was taken out by the late Mr. Samuel Archbold and myself on May 8, 1877, and which is exactly the same as the plans referred to. Unfortunately no American engine builder could be found at that time with sufficient courage to depart from the old beam engine, and make a trial of a new and more economical type, hence our patent ran out without having been used here, although a number of engines of this type have been constructed in Europe.

Philadelphia, Pa., Dec. 2, 1895.

JOHN HAUG.

season. The dominion government is also asked to station a light-ship or large nun buoy on Little's point, another dangerous spot in this vicinity. In the channel between Bois Blanc island and Amherstburg, Detroit river, there are numerous shoals that must be removed before full advantage can be taken of any part of the 20-foot channel improvements, and the Canadian authorities are asked to put dredges at work at this point as soon as possible.

## He Favors the Suggestion.

The REVIEW wrote James A. Dumont, supervising inspector-general of steam vessels, for an expression of opinion regarding the suggestion, contained in an article in our issue of Nov. 28, urging the use of surface condensers in harbor tugs of Chicago and other places where river water is used for making steam. The reply of the inspector-general is as follows:

"I have no particular suggestions to offer on the subject-matter of your article of Nov. 28, other than to say that I agree fully with the statements therein, and hope that tug owners who have to use the filthy waters of the Chicago river, and other rivers in similar condition, will appreciate, and put in practice as soon as they conveniently can, the suggestion contained in the last paragraph of the article."

Though France and Russia hold the record for speed in torpedo craft, England possesses rather more than three times as many torpedo boat destroyers as Russia and nearly eight times as many as France.



## In General.

The revival of American shipping is the topic of an article by Senator Cameron in the New Review for November, in which he expresses the opinion that the United States should secure pre-eminence in the world's carrying trade to complete her commercial system, and declares that it is of no use to nibble at the question or to advocate anything but "old-fashioned, vigorous protective methods."

The Erie Canal Traction Co., the corporation which owns franchise granted by the State of New York to the Cataract General Electric Co.—at least so far as the towing rights of the latter company are concerned,—has entered into a contract with the Erie Construction Co. to install a system of electric canal boat propulsion between Buffalo and Albany at a cost of \$2,250,000. It is said the work will proceed in step with the progress of the work on canal enlargement.

Notwithstanding the adoption of water tube boilers by England, France and Russia for cruisers and other large vessels of war, Chief Engineer Melville of the United States navy still holds in his latest annual report that "no single type of water tube boiler has yet made its appearance which can be regarded as an altogether satisfactory substitute for the Scotch pattern, and for this reason the bureau has not recommended their use in the larger and more important vessels, believing it better, for the present at least, to confine them to torpedo boats, gunboats, and the smaller cruisers."

At the time when William E. Chandler of New Hampshire was secretary of the navy Admiral Meade was commandant of the navy yard in Washington. They got into trouble somehow, these two positive gentlemen, and the commandant was summoned before the secretary one day on a matter of importance. The secretary told the commandant that if he kept on, or words to that effect, he should certainly be obliged to punish him by sending him to sea. "Mr. Secretary," said Meade, "I haven't anything to say except that when it is punishment for an officer of the navy to be ordered to sea, what is your service coming to? I should like to go to sea, sir. Good day."

The torpedo boat Cushing, in a sham attack against the Maine recently, succeeded in getting within the 500 yard circle without discovery despite the fact that the Maine had her four search lights out sweeping the horizon. Rules were arranged similar to those which have governed the drill between the torpedo station and the Cushing. Lieut Smith of the Cushing promised not to take shelter behind any obstruction within 2,000 yards, one sea mile. She was discovered only when within twenty seconds of torpedoing distance, and before all the lights could be trained upon her she had discharged all three of her torpedoes, rockets serving as torpedoes. When the allotted two minutes had expired after her discovery she was alongside the ship, having approached under reduced speed.

Referring to the use of liquid fuel on naval vessels, Chief Engineer Melville of the United States navy says in his latest annual report: "One of the gunboats now building at Newport News, Va., would be an admirable vessel for testing the merits of liquid fuel. The tests should not only be progressive but they should be varied. One of the particular questions to be determined would be how much increased power over that furnished by natural draft could be secured by burning the liquid in conjunction with coal. Another important question that might be solved would be the effect of the various fuels on the ends of the tubes. It is safe to say that valuable aid would be rendered by those interested in the development of the oil industry, and an opportunity has now occurred when the value of liquid fuel for naval purposes can be definitely determined."

## Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store at the principal points of accumulation on the lakes on Nov. 30, 1895:

	Wheat, bushels.	Corn, bushels.
Chicago.....	21,705,000	910,000
Duluth.....	5,249,000	.....
Milwaukee.....	742,000	.....
Detroit.....	434,000	10,000
Toledo.....	1,120,000	140,000
Buffalo.....	2,812,000	333,000
Total.....	32,062,000	1,393,000

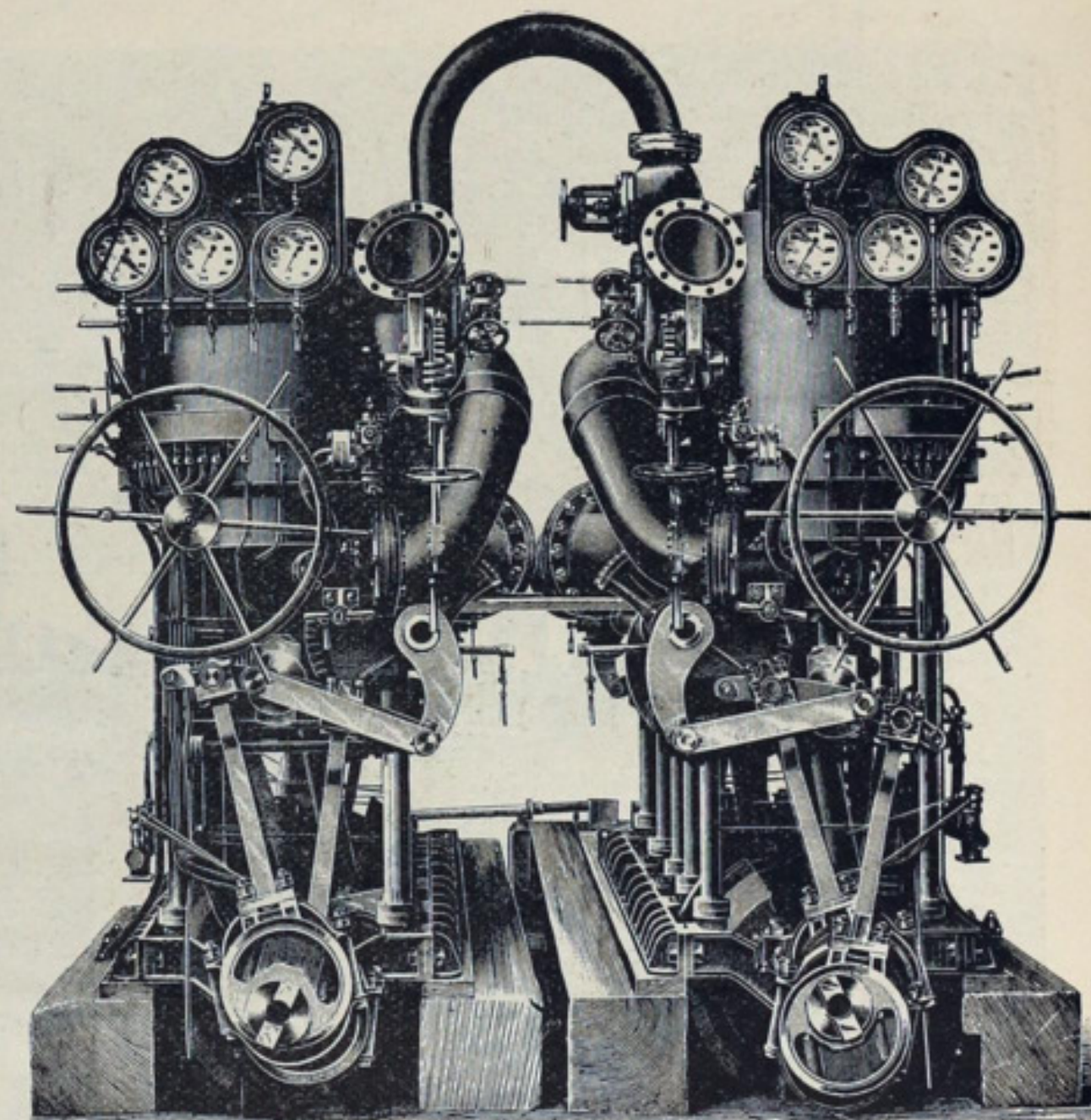
As compared with a week ago, the above figures show at the several points named an increase of 665,000 bushels of wheat and a decrease of 73,000 bushels of corn.

A cautious woman—"And so you are going for a trip to London, Mrs. Perkins?" "Yes, George wants me to agree to go by the Teutonic, but I prefer not, as they must run her very carelessly." "Carelessly!" "Yes; for she's always breaking her record."

## Engines of 27-Knot Torpedo Boat Destroyers.

The twin-screw three-cylinder triple expansion engines illustrated herewith are of a type that has been fitted to three torpedo boat destroyers, named Rocket, Shark and Surly, and built by Messrs. J. & G. Thomson, Clydebank, for the British navy. These builders are now engaged on a contract with the British government for several vessels of this kind that are to have a speed of 30 knots. The 27-knot vessels are 200 feet long. Hulls of these torpedo boat destroyers have been described and illustrated in previous issues of the REVIEW, and the important features of them are, of course, in boiler and engine rooms. In the vessels here referred to, engines are placed in one compartment aft of the boiler rooms. Four water tube boilers of the Normand type are placed in two water-tight compartments. Furnaces of the forward and after boilers discharge into separate funnels, while those of the two centre boilers lead up to a common central funnel of larger size than the other two.

The high pressure cylinders are 18½ inches in diameter, the intermediate 26½ inches and the low pressure 40½ inches, the stroke being 1 foot 6 inches. The high pressure cylinders are placed forward, and they, together with the intermediate cylinders, are fitted with piston valves of the inside type, placed on their forward sides, the low pressure cylinders having outside piston valves placed aft of the cylinders. The valve gear is of the double eccentric link motion type, and is adjustable,



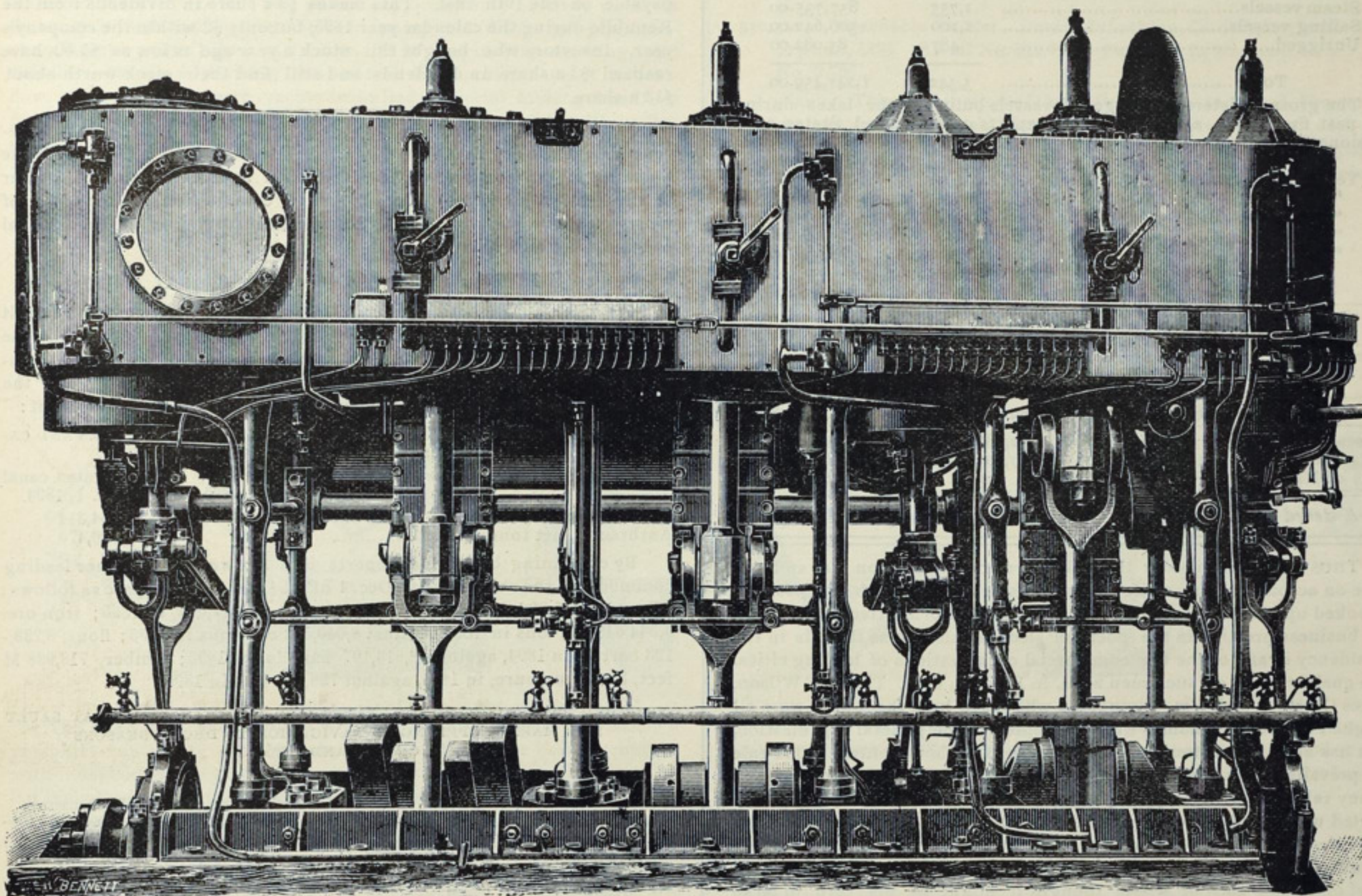
and metallic packing has been employed for the stuffing-boxes of the piston and valve spindle rod glands throughout. The cylinders which are entirely independent castings, are bolted together to provide sufficient longitudinal stiffness, and are stayed transversely between each other, as well as the gusset plates in the wings connecting the deck beams and the frames. A forward longitudinal strut extends from each of the high pressure cylinders to a gusset plate between the deck and the forward bulkhead of the engine rooms, and two similar ties secure each of the low pressure cylinders to the after structure of the vessel. The cylinder bottoms are separate castings, and are bolted to the cylinders, and they together with the cylinder covers and the top and bottom covers of the valve casings, are of cast steel. The pistons are of forged steel turned all over. The piston and connecting rods are of wrought steel, and are hollow, thereby securing lightness together with strength. The cross-head pin is fixed into the forks of the connecting rod, and is of steel, case-hardened. The piston rod-guide and head are forged with the rod, and the guide has machined recesses on the ahead side, which are filled with white metal. The ahead guide faces are of cast iron, with water circulation at the back, and the astern faces are of bronze. The bedplates are of cast steel. Each consists of two angle-bar shaped castings, which extend the whole length of the engine, and rest on longitudinal frames extending between the engine room bulkheads. The main bearing frames extend between, and are checked into, these castings, being secured to them, as well as to the floors of the vessel, by fitted bolts. The main bearings are five in number, a single bearing of extra length being placed between the intermediate and low pressure cylinders; and wrought steel columns, braced together near the middle, form the connection between the cylinders and each of these frames. The crankshafts and pins are



hollow, of steel, and are each forged in one piece. The thrust shafts and propeller shafts are like-wise of steel, and hollow. The propellers have each three blades of manganese bronze dovetailed into a boss of forged steel, and the bosses are fitted with guards and caps, in conformity with admiralty practice. The condensers are placed in the wings, the cooling surface being 3,000 square feet. The tube casings are sheet copper, and the tubes are  $\frac{5}{8}$  of an inch in external diameter by .05 of an inch thick. The steam is condensed outside the tubes, and water is circulated through them by two centrifugal pumps, assisted by a natural flow due to the velocity of the vessel. The air pumps are single-acting, and are driven by separate double-armed cranks engaging the forward ends of the crankshafts by transverse feathers, and each discharges into separate tanks.

The great area of the four boilers is 163 square feet, and the heating surface 8,500 square feet, and the boilers are worked under forced draught on the closed stokehold system. A single breasted fan, 5 feet 6 inches in diameter, is placed at the side of each boiler room for supplying forced draught to the boilers. The engines for this purpose are of the open vertical type, and air is admitted to the fans by large cowls placed directly overhead.

screw engines. In fact Messrs. Gourley Bros. & Co., engineers and ship builders of Dundee, have a number of specialties in the marine engineering line. The twin engines to which I refer were being fitted on board a finely modeled hull that is expected to be very fast, and was built for parties in Calcutta. What was new and original, at least to me, was that the engines had no front column. The bed plates extended across the ship and were bolted together at the middle line of the keel. Three turned columns are placed at proper intervals on the middle line of the bed plate. On top of these turned columns are placed strong girders of cast iron, bolting the cylinders of the port and starboard engines together. The back columns are of cast iron, in the usual form, and have the guide bars bolted to them. The guide bars in this case are of hollow sections, and are engaged by the cross head shoe, making the backing and go-ahead sides of the same surface. The engines are tied across, top and bottom, with the working gear, including the telegraph, in place on one of the middle columns, so that one engineer can handle both engines with ease. It is about as compact and handy a set of twin-screw engines as I have ever seen, and I understand it makes a solid job that is free from vibration."



TWIN-SCREW TRIPLE EXPANSION ENGINES OF 27-KNOT TORPEDO BOAT DESTROYERS.

On full speed official trials each of these three vessels attained a speed of full  $27\frac{1}{2}$  knots, with a mean of about 398 revolutions, 188 pounds steam pressure, 25 inches vacuum and 4,250 horse power.

#### Mr. Miller's Observations.

Mr. Walter Miller, who was up to a short time ago designing engineer with the Globe Iron Works Co., Cleveland, and who is now traveling in Europe, writes of a very cordial reception tendered him in most of the ship yards of England and Scotland. Mr. Miller designed the quadruple expansion engines of the Northern line passenger steamers North West and North Land and was, of course, called upon to carry out a large part of the work of fitting Belleville water tube boilers to these ships. He says that the Belleville boilers being constructed in England by Messrs. Maudslay Sons & Field have a number of improvements over those made for the North West and North Land. At a test which he witnessed in England the boilers were burning 40 pounds of coal per square foot of grate surface without any trouble, and with very little smoke. Mr. Sampson, manager for Maudslay Sons & Field, told him, he says, that he was quite prepared to guarantee an evaporation of nine pounds of water per pound of coal per hour.

"While at Dundee," says Mr. Miller, "I saw a remarkable set of twin-

#### Handsome Photographs of Lake Steamers.

For some time the REVIEW has been planning to secure photographs of lake vessels under way, giving an artistic marine scene as well as a picture of the vessel. Arrangements have been completed and the first consignment has been received. They are 8 by 10 inches on tea colored mounts and will be sent to any address. We have a number in stock, and as more are being taken every few days we can furnish prints of almost any of the modern freight steamers at \$1 each. The following are on hand:

J. J. McWilliams,	J. N. Glidden,	Cherokee,	D. Leuty,
Yukon,	Wawatam,	Majestic,	F. L. Vance,
Colgate Hoyt,	Briton,	Chas. Hebard,	Selwyn Eddy,
John Harper,	Pillsbury,	Saginaw Valley,	Forest City,
Gladstone,	Maritana,	S. S. Curry,	Wallula,
John V. Moran,	Malta,	H. J. Johnson,	Jim Sheriffs,
John Mitchell,	Quito,	Choctaw,	Zenith City,
Corsica,	City of Collinwood,	Victory,	Merida,
Annie M. Ash,	Pascal,	P. Pratt,	

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ALL NEW HYDROGRAPHIC CHARTS ARE KEPT IN STOCK BY THE MARINE REVIEW, 516 PERRY-PAYNE BUILDING, CLEVELAND.





DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 516 Perry-Payne building, Cleveland, O

SUBSCRIPTION—\$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, 75 cents. Advertising rates on application.

The books of the United States treasury department on June 30, 1895, contained the names of 3,342 vessels, of 1,241,459.14 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons, and over that amount, on the lakes on June 30, 1894, was 359 and their aggregate gross tonnage 634,467.84; the number of vessels of this class owned in all other parts of the country on the same date was 316 and their tonnage 642,642.50, so that half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1895, was as follows:

Class.	Number.	Gross Tonnage.
Steam vessels.....	1,755	857,735.00
Sailing vessels.....	1,100	300,642.00
Unrigged.....	487	83,082.00
Total.....	3,342	1,241,459.00

The gross registered tonnage of vessels built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

Year ending June 30,	Number.	Net Tonnage.
1891.....	204	111,856.45
" " " 1892.....	169	45,168.98
" " " 1893.....	175	99,271.24
" " " 1894.....	106	41,984.61
" " " 1895.....	93	36,353.00
Total.....	747	334,634.28

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.  
(From Official Reports of Canal Officers.)

	St. Mary's Falls Canal.			Suez Canal.		
	1894.	1893.	1892.	1894.	1893.	1892.
No. vessel pass'ges	14,491	12,008	12,580	3,352	3,341	3,559
T'n'ge, net registd	13,110,366	9,849,754	10,647,203	8,039,106	7,659,068	7,712,028
Days of Navigat'n	234	219	223	365	365	365

Entered at Cleveland Post Office as Second-class Mail Matter.

THUS FAR IN its history the Lake Carriers' Association has suffered little on account of any strife for the presidency, although the position is looked upon as one to which considerable honor is attached. There is a business prestige in the position also, as much so as there is in the presidency of any of the big commercial organizations of leading cities. The qualifications of such men as M. A. Bradley, Capt. Thomas Wilson, James Corrigan and Wm. Livingston who have held the office, were all weighed before their names were presented to the general organization, as it has been the custom to elect a president without contest. One rule has prevailed—the candidate has always been a vessel owner unhampered by any relations with shippers. The presidents thus far have all been elected without objection of any kind, on the surface, although it can not be denied that at each succeeding election there were several leading members of the association who would be pleased with the honor of the chief office and each of whom thought it might be his turn to be so honored. But these feelings did not materialize in open meeting, either from the gentlemen themselves or their friends. Contests were avoided and it is probable that the same rule will prevail at the meeting in Detroit next month, but the ex-presidents and other members who have no personal interest in the presidency are finding some difficulty in uniting on a man for the office. Some time ago it was thought that Capt. James Millen of Detroit would be accorded the honor, but as they say in politics his record has been searched. He is weak on the matter of a bridge over the Detroit river. Not long ago he joined Senator McMillan, with whom he has been closely related in a business way, in leaning somewhat toward the construction of a bridge. The bridge question will probably come up again in congress this winter, and Capt. Millen's position may possibly injure his chances of being elected president of the vessel owners' organization. If there is no objection to the presidency again going to Cleveland, Henry A. Hawgood, J. C. Gilchrist and B. L. Pennington will very probably be prominent among those named for the place. Mr. Hawgood is forceful as a leader but unassuming in a secondary position; Mr. Pennington is scholarly and would make a good presiding officer, and Mr. Gilchrist is shrewd and conservative.

NOW THAT the branch hydrographic offices of Cleveland and Chicago have proven their usefulness beyond all question, it would seem that the vessel interests should aid the service in every way possible. It is un-

fortunate that the branch office in the Arcade, Cleveland, is so poorly located. Full 90 per cent. of all matters pertaining to shipping in Cleveland is conducted in three buildings at the foot of Superior street. These are the Perry-Payne, Western Reserve and Wade building, the first of which is taken almost entirely with offices of vessel owners and iron ore shipping concerns. The hydrographic office should be located in the Perry-Payne building and the wonder is that it ever went elsewhere.

IT IS NOW quite certain that the annual meeting of the Lake Carriers' Association in Detroit will occur between the 10th and 20th of January. Secretary Keep is now in correspondence with other officers of the association regarding the date of the meeting. It has been customary to hold the meetings in January, and the constitution fixes Detroit as the place of meeting. There will be no deficit in the treasury of the association this year, notwithstanding the adjustment of some claims that have been hanging fire for a long time past.

LATE DEALINGS in stock of the Republic Iron Co., are indicative of the great change that has come over the iron market since the panic. Another dividend of \$1 a share has been declared by this company. It is payable on the 10th inst. This makes \$3 a share in dividends from the Republic during the calendar year 1895, but only \$2 within the company's year. Investors who bought this stock a year ago as low as \$5.50 have realized \$3 a share in dividends and still find their stock worth about \$13 a share.

MR. L. E. COOLEY, one of the deep waterways commissioners recently appointed by President Cleveland, seems greatly pleased with the members of the commission, both Canadian and American. In a letter to the REVIEW he says: "The Canadian commission is composed of most excellent men and I look for a wise consideration of the mutual problems between us."

### Lake Superior Business in Coal—Canal Reports.

Statements from both the Canadian and United States canals at Sault Ste. Marie, giving business returns to Dec. 1, which is practically the close of the season, show a decrease in shipments of soft coal as compared with the same date in 1894 of 156,511 tons, and in anthracite the decrease is 81,193 tons. The following table shows the coal movement:

#### COAL SHIPMENTS TO LAKE SUPERIOR THROUGH UNITED STATES AND CANADIAN CANALS AT SAULT STE. MARIE.

	Both canals to Dec. 1, 1895.	United States canal to Dec. 1, 1894.
Bituminous, net tons.....	2,107,804	2,264,314
Anthracite, net tons.....	445,277	526,470

By combining both canal reports it is shown that in other leading commodities the shipments to Dec. 1 of 1894 and 1895 compare as follows: Wheat, 34,495,882 bushels in 1894, against 42,817,076 in 1895; iron ore, 6,544,648 net tons in 1894, against 8,040,558 net tons in 1895; flour, 8,738,123 barrels in 1894, against 8,613,197 barrels in 1895; lumber, 718,938 M feet, broad measure, in 1894, against 738,294 feet in 1895.

#### COMBINED TRAFFIC OF UNITED STATES AND CANADIAN CANALS AT SAULT STE. MARIE—OPENING OF NAVIGATION TO DEC. 1, SEASONS OF 1894 AND 1895.

Freight items.	Designation.	United States canal to Dec. 1, 1894.	Both canals to Dec. 1, 1895.
Copper.....	Net tons.....	98,833	107,117
Corn.....	Bushels.....	1,530,008	791,079
Building stone.....	Net tons.....	21,417	24,326
Flour.....	Barrels.....	8,738,123	8,613,197
Iron ore.....	Net tons.....	6,544,648	8,040,558
Iron, pig.....	Net tons.....	21,068	24,481
Lumber.....	M. feet B. M.....	718,938	738,294
Silver ore.....	Net tons.....	412	100
Wheat.....	Bushels.....	34,495,882	42,817,076
Unclassified fr'ght.....	Net tons.....	181,690	138,677
Passengers.....	Number.....	13,869	16,537

Freight items.	Designation.	United States canal to Dec. 1, 1894.	Both canals to Dec. 1, 1895.
Coal, anthracite.....	Net tons.....	526,470	445,277
Coal, bituminous.....	Net tons.....	2,264,314	2,107,804
Flour.....	Barrels.....	783	2,150
Grain.....	Bushels.....	10,500	35,650
Manufactured iron.....	Net tons.....	36,107	74,976
Salt.....	Barrels.....	237,461	271,997
Unclassified fr'ght.....	Net tons.....	268,803	315,469
Passengers.....	Number.....	13,331	16,944

The total freight tonnage of the United States canal to Dec. 1, 1895, is 14,260,756 net tons, of which 11,430,062 was eastbound and 2,830,694 westbound. During the month of November 131,647 tons of freight was passed through the Canadian canal, and of this 88,638 tons was eastbound and 43,009 tons westbound.

Freight tonnage of the United States canal during November was 1,479,373, of which 1,115,504 was eastbound and 363,869 westbound; vessel passages, 1,447; lockages, 768; registered tonnage, 1,498,096; number of passengers, 361.



## Trade Notes.

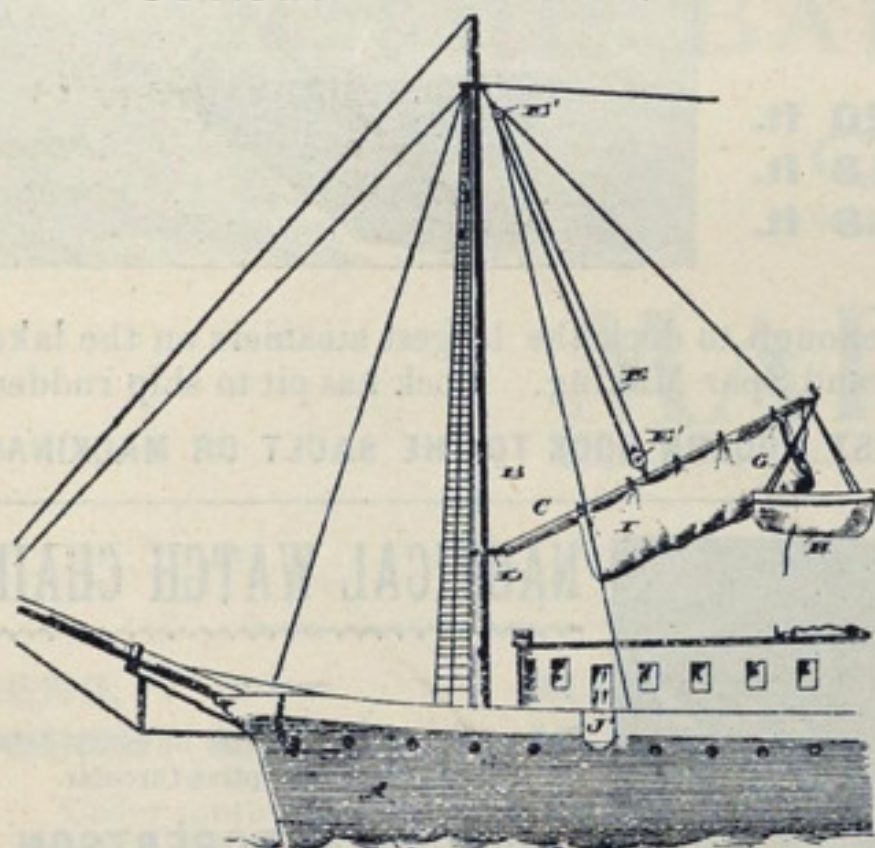
The B. W. Goodsell Packing Co. of No. 20 West Lake street, Chicago, is sending out a very handsome calendar to the trade, on which is an excellent portrait of the senior member. Some ten thousand copies will be distributed.

Kelley, Spear & Co., Bath, Me., closed a contract a few days ago with the Delaware & Hudson Canal Co. for two tow barges, one 190 feet over all and of 1,600 tons capacity and the other 155 feet over all and of 800 tons capacity.

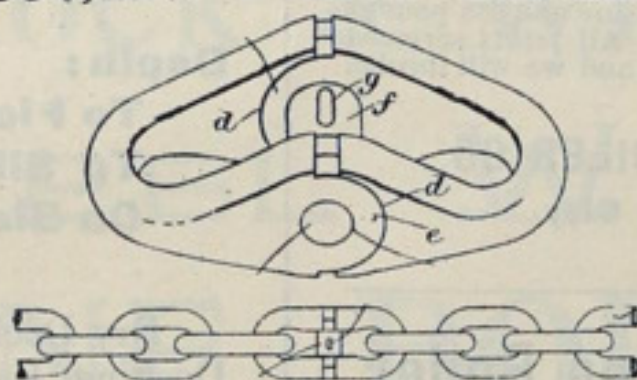
Through an error in the new advertisement of the Roberts water tube boiler, the number of boilers built to date was put down as 600 instead of 800 as it should have been. While 600 would have represented the number of boilers turned out by this company not long since, the increase in the business has been very rapid of late and has necessitated an enlargement of the plant recently. The fast Detroit river steamer Unique, fitted with these boilers, is now making regular trips.

The advantage of the Alfred B. Sands & Son water closet is that no cut-off or spring valve is necessary to prevent flooding the boat as in other makes of marine closets. The pump supplies plenty of clean water to thoroughly flush and cleanse the bowl, pump and discharge pipes, discharging at a point below water line. It is simple, easy working, and noiseless, and when properly connected it is impossible for it to overflow. Where the space in yachts is limited a special folding handle is furnished. There are other space-saving features which will be explained upon application to Alfred B. Sands & Son, No. 134 Beekman street, New York.

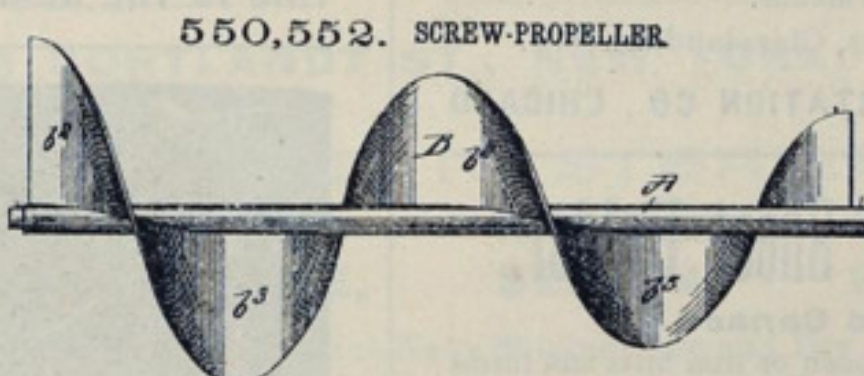
550,343. LIFE-SAVING APPARATUS.



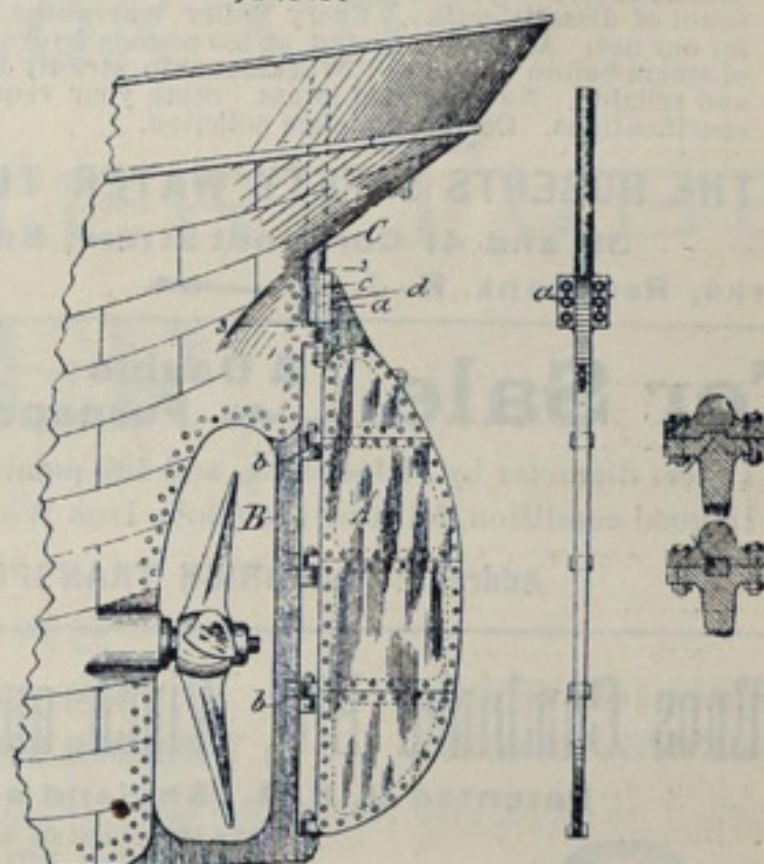
550,417. SHACKLE FOR VESSELS' CHAINS



550,552. SCREW-PROPELLER



550,522. DETACHABLE RUDDER



The Dean Bros. Steam Pump Works of Indianapolis has just issued a pamphlet containing a list of lake steamers that have been furnished with independent air pumps and condensers of their manufacture. The list includes some of the largest and finest steamers on the lakes, having an aggregate horse power of 150,000. This business has all been secured in four years. Testimonials printed with this list of vessels are from Frank E. Kirby and A. Geo. Mattson of the Dry Dock Engine Works, Henry D. Penton of S. F. Hodge & Co. and Wm. L. E. Mahan of the Frontier Iron Works, all of Detroit; James Davidson and F. W. Wheeler & Co. of West Bay City, and Wm. Meade, chief engineer of the steamer Uganda.

L. W. Ferdinand & Co. of Boston, who were recently appointed sole agents for the sale of Jeffery's marine glue in the United States, note in a letter directing attention to the extensive sale of this article that within a few days past they have received orders from the Cramps for 6,100 pounds and from the Norfolk navy yard for 4,000 pounds. This glue is used principally for paying decks, in either new work or repairs. It has been used on all the cup defenders since the Puritan; on the American line steamers St. Louis and St. Paul; on the battleships Indiana, Massachusetts and Iowa; on the cruisers Minneapolis, Columbia, Atlanta and Brooklyn, and on steam and sailing yachts as well as freight and passenger vessels almost without number.

In 1860 Irving M. Scott, whose ability and energy has built up the big plant of the Union Iron Works, San Francisco, was engaged as a draughtsman in the establishment. Within five years he became a member of the firm and was made general manager. When he first became associated with the works only twenty-two men were employed, while today they furnish employment to 1,400 men and represent an invested capital of \$2,000,000.

## Illustrated Patent Record.

SELECTED ABSTRACTS OF SPECIFICATIONS OF A MARINE NATURE—FROM LATEST PATENT OFFICE REPORTS.

550,343. Life-saving Apparatus. Jacob Greener, Elmira, N. Y. Filed Apr. 10, 1895. Serial No. 545,213.

Claim. The combination with a vessel having an opening in its side rail, of a boom pivotally and vertically movably mounted on the mast, a sack suspended from the boom, means at the outer end of the boom for supporting a life-boat, and means for swinging the boom to bring the inner end of the sack coexistent with said opening.

550,417. Shackle for Vessels' Chains. James B. Miller, Rockland, Me. Filed Feb. 20, 1895. Serial No. 539,039.

Claim. A shackle for vessels' chains comprising in its construction two U-shaped clevises provided with eyes at their open ends and with sockets or recesses to receive the rounded portions of the open ends, a pintle or pivot pin extending through the eyes of the rounded ends, a sleeve surrounding said pintle or pivot pin between the ends of the clevises, and a cotter or pin passing through said sleeve and pintle.

550,522. Detachable Rudder. David McLachlan, Cardiff, England. Filed Sept. 10, 1894. Serial No. 522,602. Patented in England Feb. 7, 1894 No. 2,705.

Claim. The combination of the bottom of a rudder head, two vertical lugs or flanges incorporated therewith and standing one on each side thereof, the top of the rudder, two vertical lugs or flanges incorporated therewith and standing one on each side thereof, holding bolts adapted

to hold the two lugs or flanges on the top of the rudder to the two lugs or flanges on the bottom of the rudder head and a central vertical device between the two pairs of lugs adapted to supplement the holding power of the said bolts.

550,552. Screw Propeller. Charles P. Budd, St. Louis, Mo. Filed July 18, 1895. Serial No. 556,363.

Claim. A screw propeller having a single tapering spiral blade, widening from its front to its rear end, and making two turns having the same pitch around a central longitudinal line, from which its inner edge is substantially equidistant throughout.

## The New Ore Railway.

Officials of the Cleveland-Cliffs and Lake Angeline mining companies no longer seek to cover up their connection with the new Lake Superior & Ishpeming Railway Co., which has begun the construction of a railway from Ishpeming to a point on Lake Superior just above Marquette. The mining companies are the principal purchasers of the bonds of the railway company. They expect to furnish business to the extent of 8,000,000 to 10,000,000 tons of ore to the new railway. This will be mainly from the mines of the Cleveland-Cliffs, Lake Angeline and Lake Superior companies. The railway, which will have about fifteen miles of main line, touching Lake Superior at Presque Isle, just above Marquette, will be finished about the middle of June next. Winston Bros. of Minneapolis have the contract for constructing the line.

A CHART COVERING LAKE HURON, GEORGIAN BAY AND THE STRAITS OF MACKINAC, ALL ON ONE SHEET, HAS BEEN ISSUED BY THE HYDROGRAPHIC OFFICE AND MAY BE HAD FROM THE MARINE REVIEW AT 75 CENTS. LAKE SUPERIOR ON ONE SHEET, LAKE MICHIGAN ON A SINGLE SHEET, AND LAKES ERIE AND ONTARIO IN THE SAME FORM ARE ALSO IN PRINT AND SELL AT THE SAME PRICE.





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Works, Red Bank, N. J.

## For Sale A Double Furnace Marine Boiler,

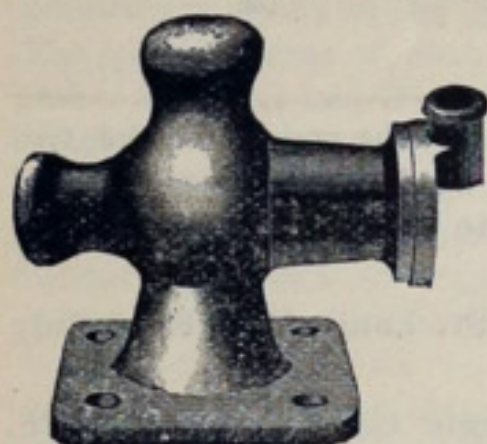
11 feet diameter by 14 feet long, and 120 pounds steam.

In good condition, built by the Globe Iron Works, Cleveland, in 1891.

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Takes the place of wooden or iron bitts and forms a Combination Bitt and Winch. Takes up less room than the ordinary bitt. Can be used to great advantage as a Windlass or Sheet Holder on Yachts. An examination will convince you of the many uses to which it can be put.

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And by Ship Chandlers in every seaport city lake port and town.

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Length, 400 feet,

Width:

On top, 95 feet,

Bottom, 55 "

Gate, 62 "

Depth:

To Floor, 20 ft.

To Sill, 18 ft.

On Blocks, 16 ft.



Dry Dock large enough to dock the largest steamers on the lakes. Docking, Repairing and Spar Making. Dock has pit to ship rudders.

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## NAUTICAL WATCH CHAIN.

Solid Gold. Ship-shape in every detail. Send for Descriptive Circular.

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You can get it from **Chutes, High Platform or Dock.**

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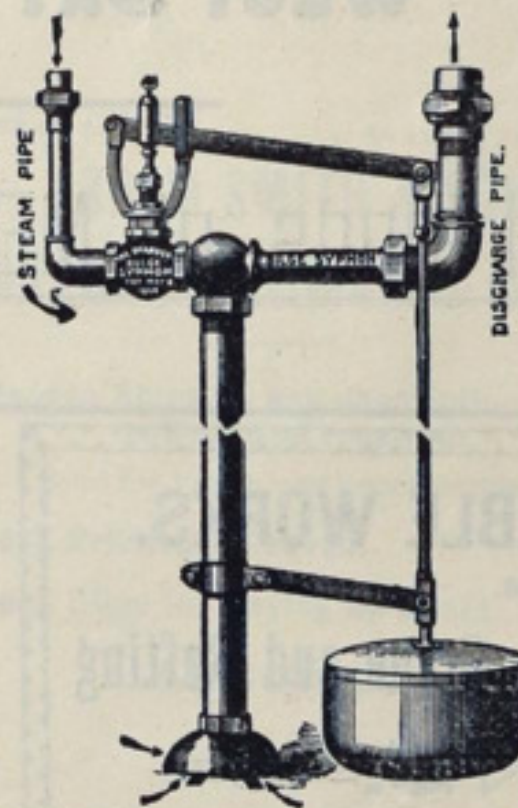


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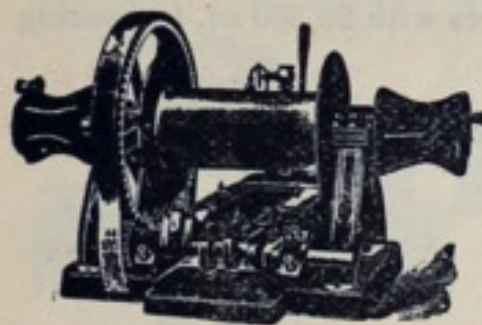
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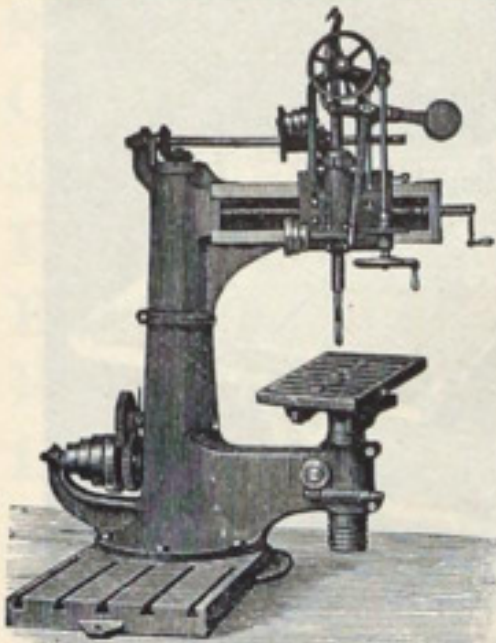
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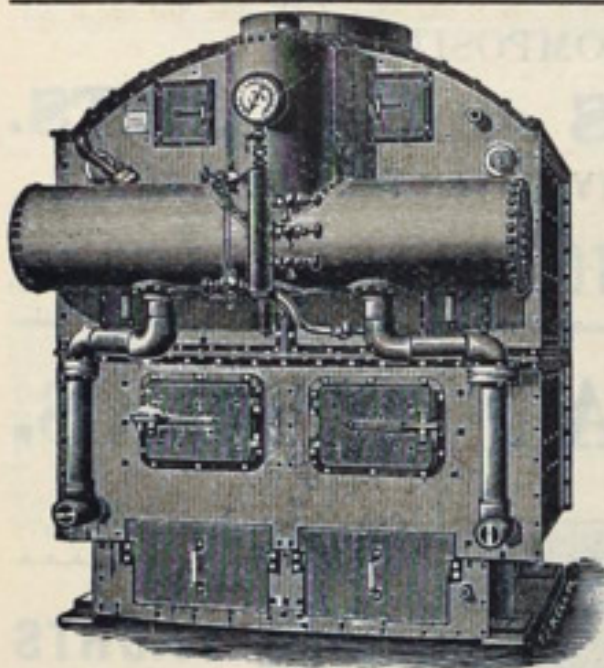
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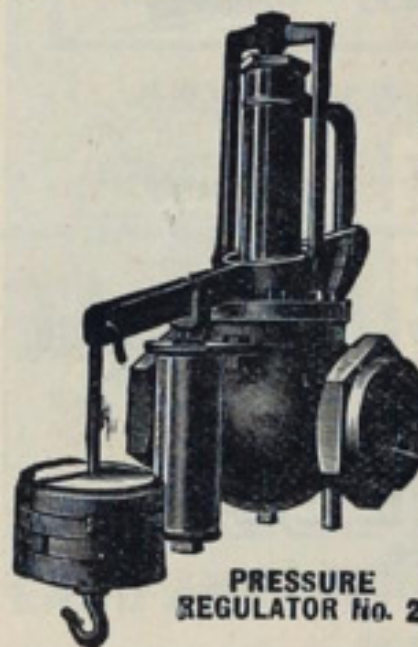
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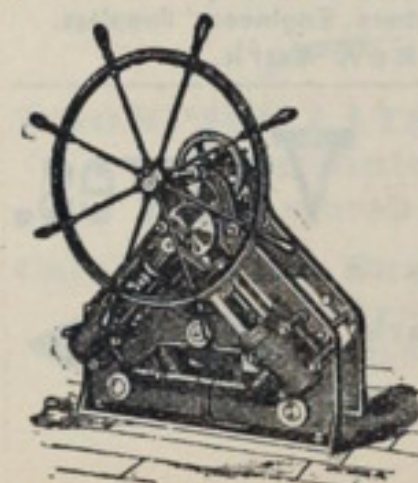
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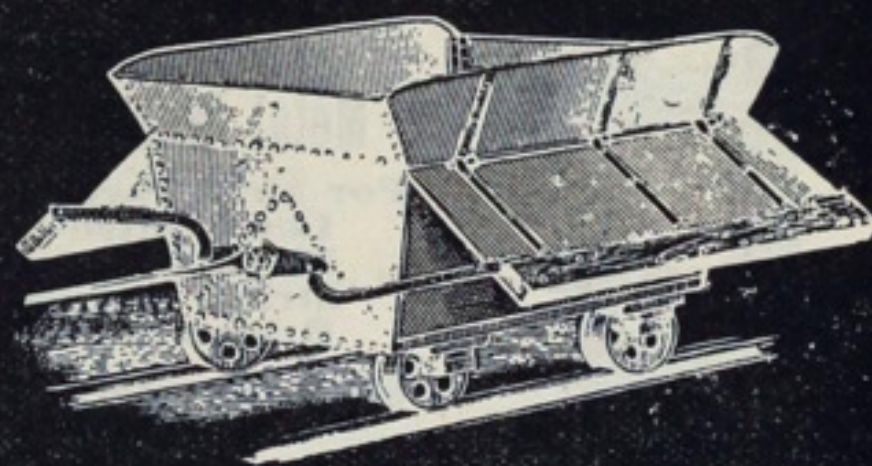
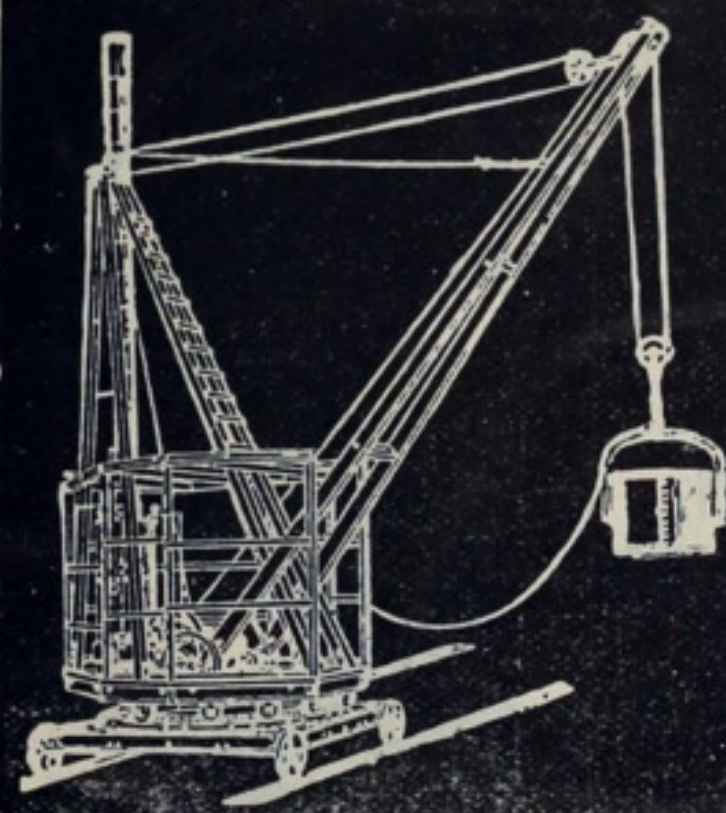
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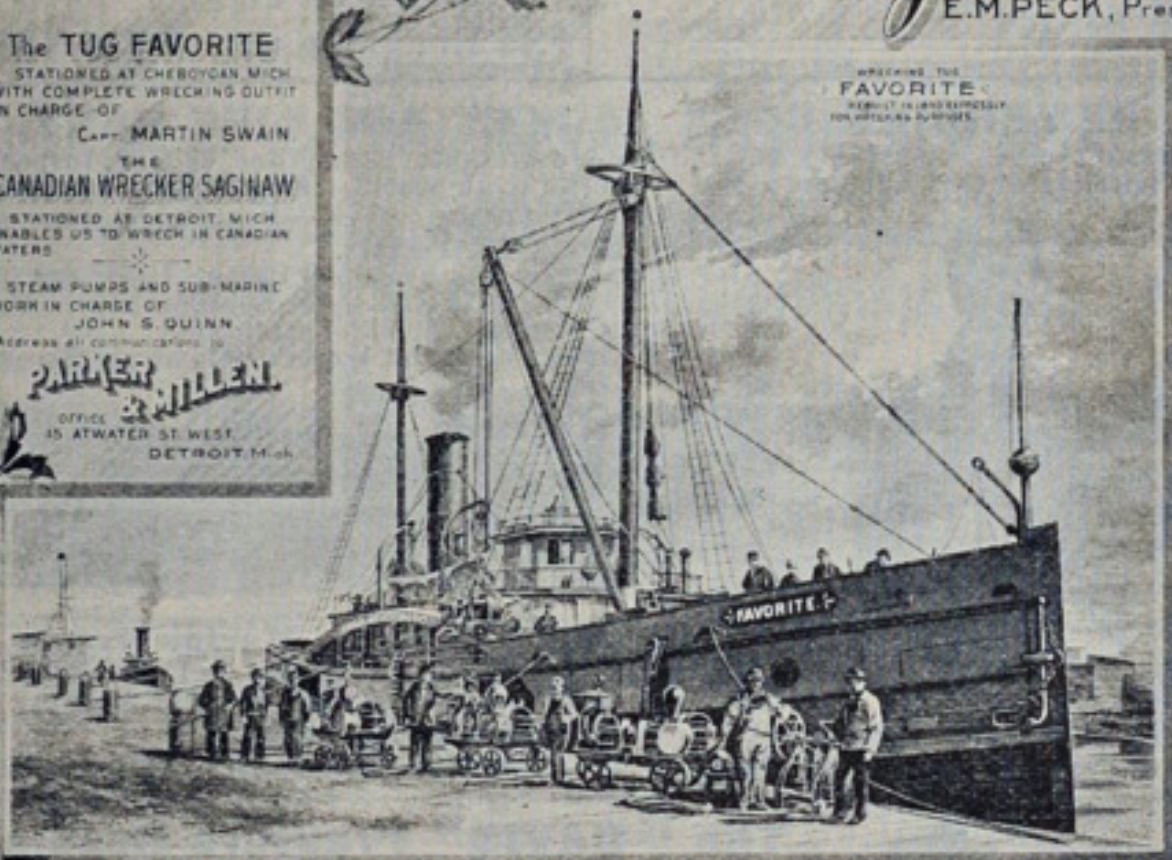
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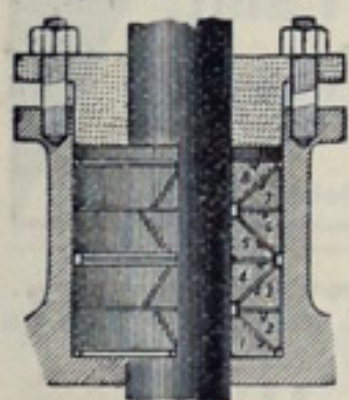
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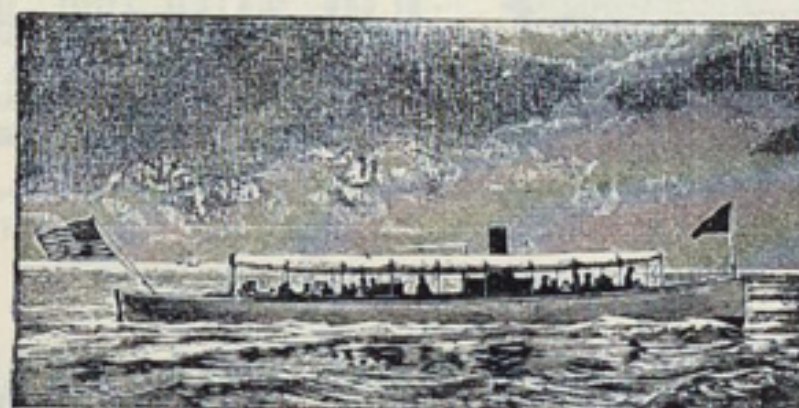
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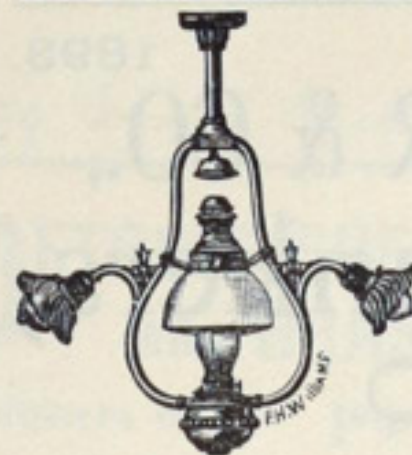
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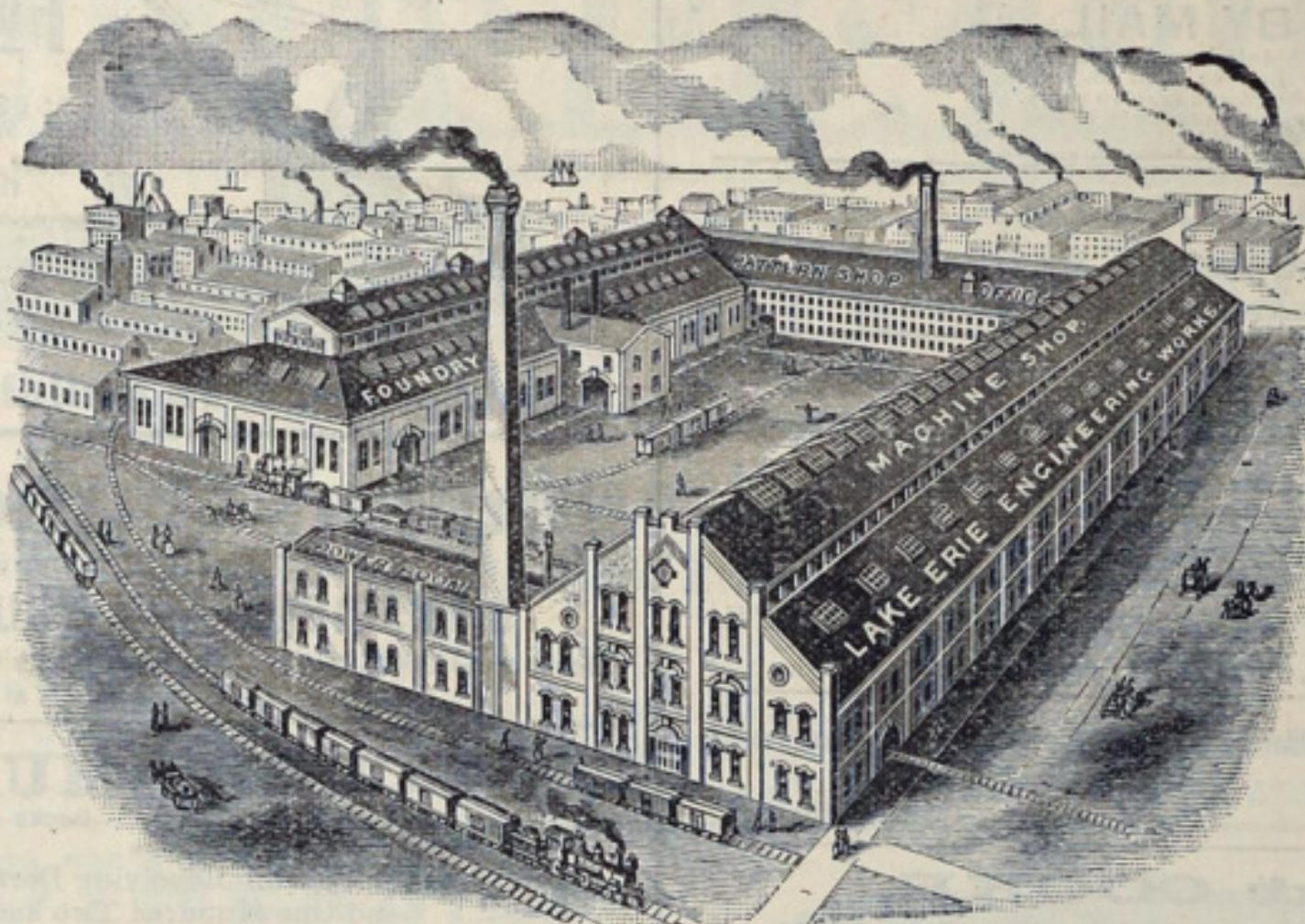


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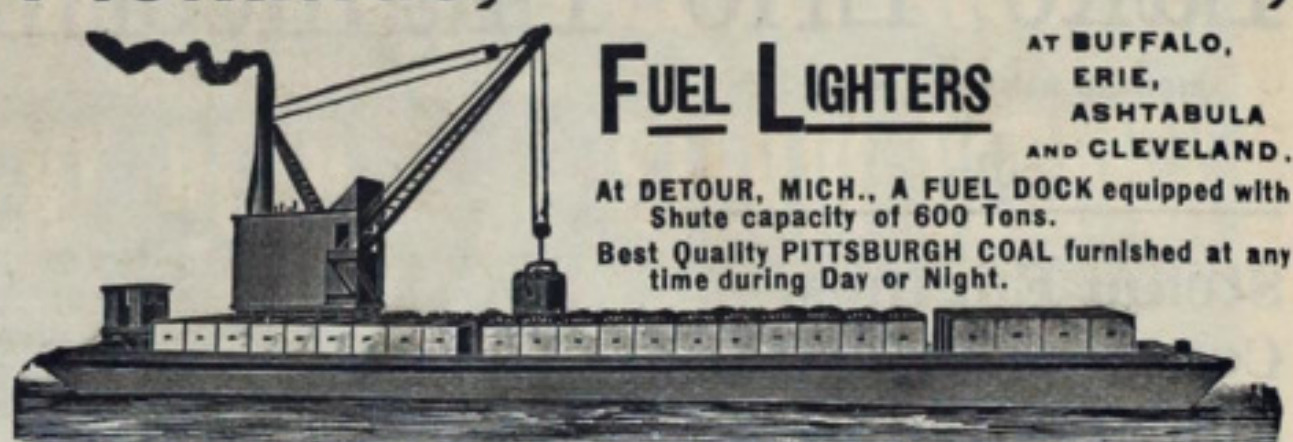
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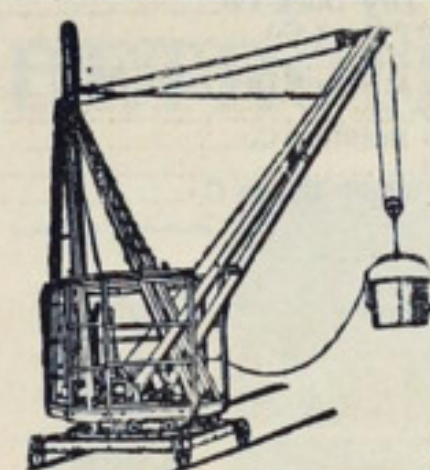
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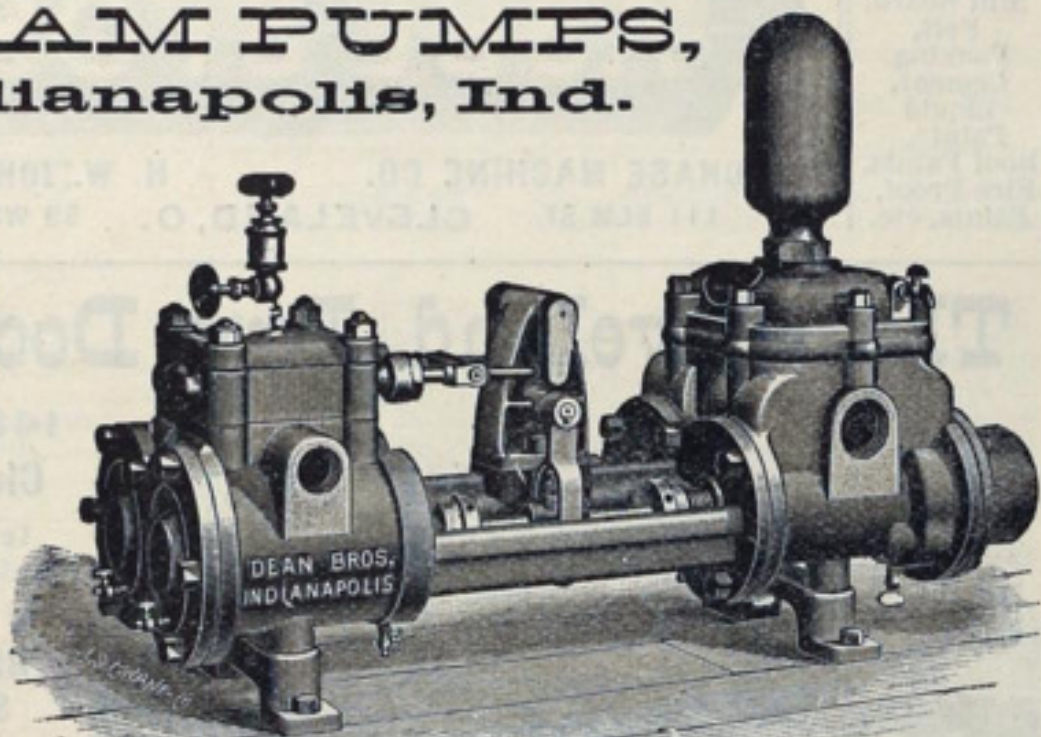
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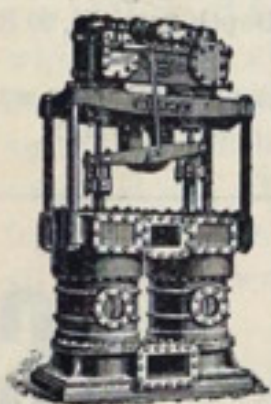
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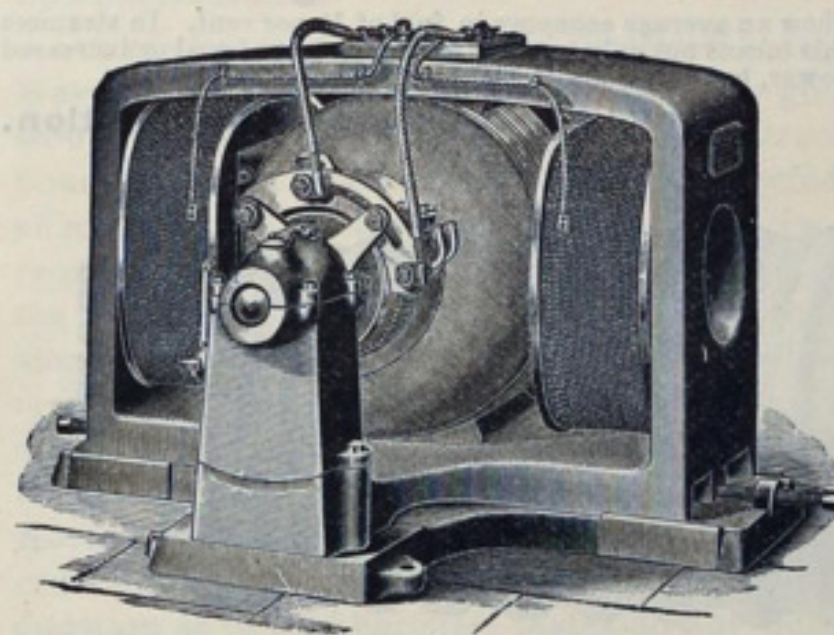


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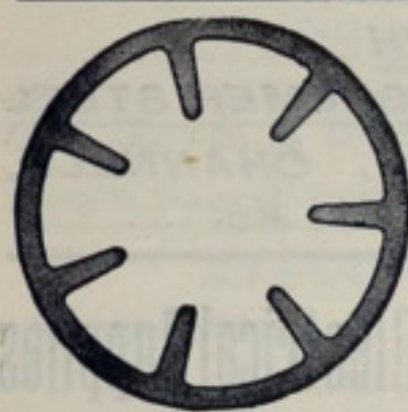
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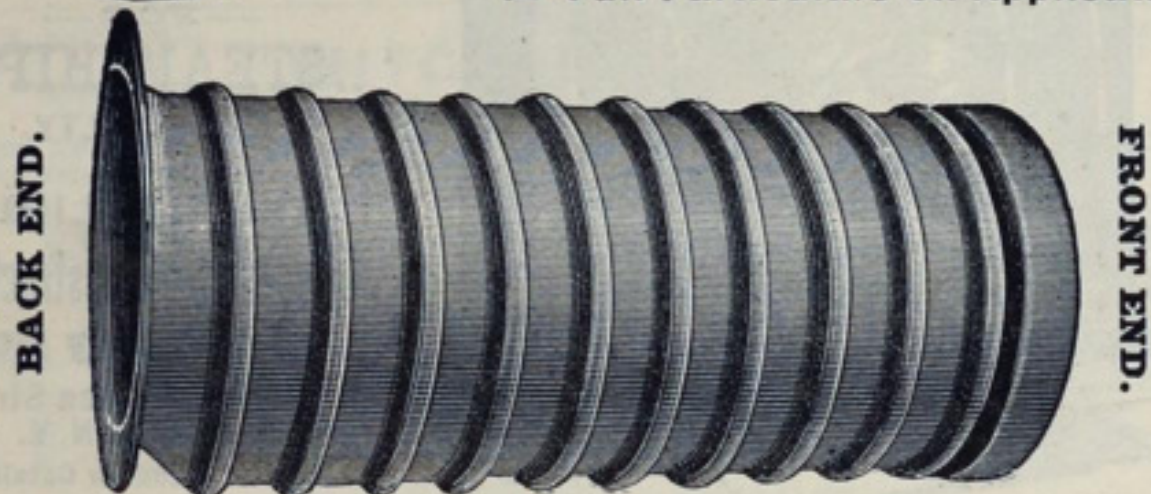
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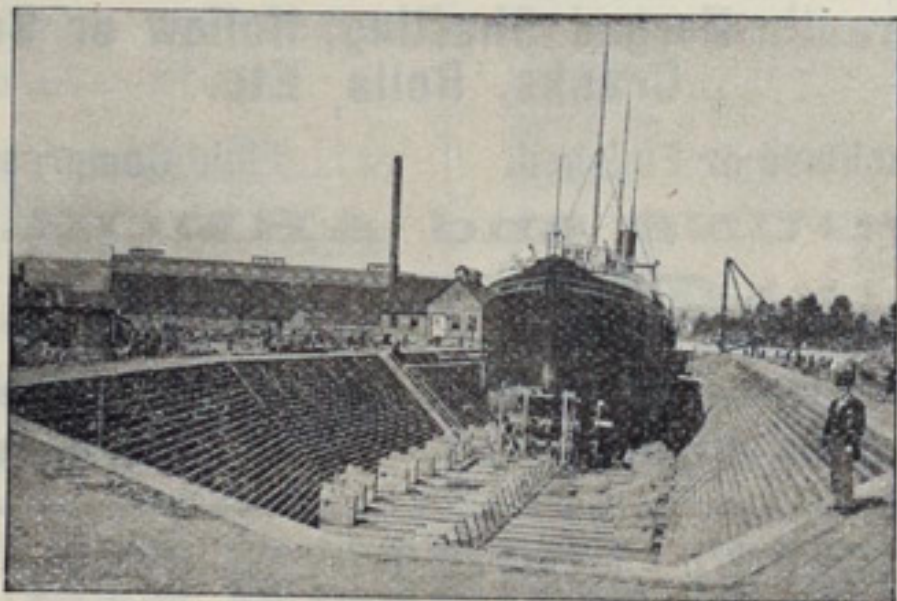
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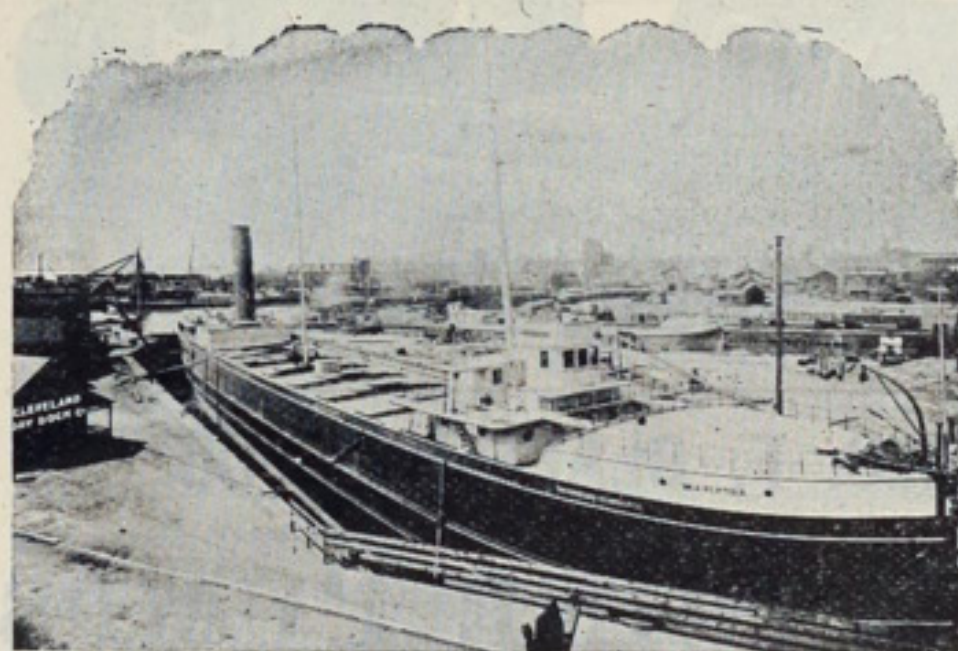
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